

REMARKS/ARGUMENT

Claims 1-12 are pending in this application. Claims 1-7 stand rejected. By this Amendment, claims 1-4 have been amended and claims 8-12 have been added. The amendments made to claims 1-4 do not alter the scope of these claims, nor have these amendments been made to define over the prior art. Rather, the amendments to claims 1-4 have been made to improve the form thereof. In light of the amendments and remarks set forth below, Applicant respectfully submits that each of the pending claims is in immediate condition for allowance.

Claim 1 stands rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,405,366 (“Hardman”). Applicants traverse this rejection.

Among the limitations of claims 1 and 2 that are not in the prior art is a base including an integrally-formed central portion and a peripheral portion surrounding at least a part of said central portion.

To anticipate a claim under 35 U.S.C. § 102, the cited reference must disclose every element of the claim, as arranged in the claim, and in sufficient detail to enable one skilled in the art to make and use the anticipated subject matter. See, PPG Industries, Inc. v. Guardian Industries Corp., 75 F.3d 1558, 1566 (Fed. Cir. 1996); C.R. Bard, Inc. v. M3 Sys., Inc., 157 F.3d 1340, 1349 (Fed. Cir. 1998). A reference that does not expressly disclose all of the elements of a claimed invention cannot anticipate unless all of the undisclosed elements are

inherently present in the reference. See, Continental Can Co. USA v. Monsanto Co., 942 F.2d 1264, 1268 (Fed. Cir. 1991).

In the golf club of the present invention, at least the face thereof is made of a member different from the other members. The face itself is a one-piece compound, made using a single metallic material. The metallic morphology of the periphery portion of the face member is changed by welding the face member to the other members at the periphery portion of the face member. In this manner, the hardness of the metallic material itself is changed at the periphery portion so that the hardness of the periphery portion becomes lower than the hardness of the central portion of the face member. That is, in the present invention, although both the central portion and the periphery of the face member are formed from a single metallic component, the hardness of the metallic material itself is designed to be high at the central portion, and the hardness of the metallic material itself is designed to be low at the periphery portion.

In contrast, in Hardman, a wood club head is shown in Figs. 11 and 12. The body 85 can be made of wood or metal, and the insert 79 is positioned in the recess 90 in the face of the club. The elliptical face insert 79 includes the central portion 80 and a plurality of the elliptical rings 81, 82, 83, and 84, and the hardness of the central portion 80 is 80 Shore A and that of the ring 84 is 40 Shore A so that the hardness of the central insert portion becomes higher than that of the peripheral portion.

However, Hardman, does not disclose nor suggest to form the face insert 79 by using a metallic material. In column 3, lines 25-28 of Hardman, it is described that the center and the rings can be formed from any suitable insert material for example, Cycolac plastic (a styrene-butadiene-acrylonitrile copolymer), Surlyn (an ionomer resin), Epoxy composite, etc. All of these are organic materials and no metallic materials are included.

Further, as shown in Figs. 11 and 12 of Hardman, the central portion 80 and the plurality of rings 81, 82, 83, and 84 are formed by binding different members. Each member is distinctively formed using materials having different hardnesses, and the hardness of the central portion of the face is made higher by using a material having a high hardness, and the hardness of the periphery portion of the face is made lower by using a material having a low hardness. In the club head shown in Figs. 15 and 16 of Hardman, although the face insert 101 is made of a single material, the substantial hardness of the face insert 101 is merely changed by changing the thickness of the face insert 101 in the cross-sectional direction. Accordingly, the hardness of the material itself is not changed as disclosed in the present invention.

Accordingly, the present invention in which the face member is formed by using a single metallic material and the hardness of the central portion of the face member is made higher than the peripheral portion thereof, cannot be easily conceived by ordinary skill in the art from the disclosure of Hardman.

New claims 8-12 are of similar subject(?) to allowable claims 1-7 for the same reasons as discussed above. Therefore, Applicants respectfully request allowance of claims 8-12 as well.

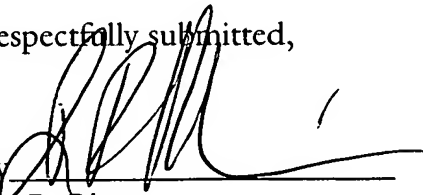
Applicant has responded to all of the rejections and objections recited in the Office reconsideration and Notice of Allowance for all of the pending claims is therefore respectfully requested.

The amendments to the claims are for clarification purposes only and are not intended to limit the scope of the claims in any way. It is asserted that the present amendment places the application in a form for allowance. Entry of this amendment is therefore earnestly solicited.

If the Examiner believes an interview would be of assistance, the Examiner is welcome to contact the undersigned at the number listed below.

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Respectfully submitted,

By 

Ian R. Blum

Registration No.: 42,336
DICKSTEIN SHAPIRO MORIN &
OSHINSKY LLP
1177 Avenue of the Americas - 41st Floor
New York, New York 10036-2714
(212) 835-1400
Attorneys for Applicant

IRB/mgs

APPENDIX A
Complete Set of Claims Under 37 CFR 1.125

Sub. B' > Claim 1. (Currently Amended) A golf club head, comprising:
a ball hitting face which includes a an integrally formed central portion and a
peripheral portion surrounding at least a part of said central portion,
wherein said golf club head is made of a metal, and the hardness of said peripheral
portion is lower than the hardness of said central portion.

ai Claim 2. (Currently Amended) A golf club head, comprising:
a face member forming a ball hitting face, said ball hitting face including a an
integrally formed central portion and a peripheral portion surrounding at least a part of said central
portion,
wherein said golf club head is manufactured by a method comprising the steps of:
forming said face member from a raw material separately from other members used
for said golf club head; and
subsequently welding said other members to said face member at a periphery of said
face member, and
said golf club head is made of a metal, and the hardness of said peripheral portion is
smaller than the hardness of said central portion.

Claim 3. (Currently Amended) A golf club head according to claim 1, wherein
the width of said peripheral portion of said hitting face is in a range between about 5
and 20 mm, the width of said peripheral portion being determined by:
measuring a hardness distribution of said hitting face from an arbitrary point A on the
edge of said hitting face, passing through the center of said hitting face, to a point B on the opposite
edge of said hitting face;

determining the hardness of said central portion by taking an average of the hardness measured in an area in the vicinity of the center of said hitting face where the difference in hardness in the area is in the range of $\pm 5\%$;

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determining the hardness of said peripheral portion in the vicinity of the point A by taking an average of the hardness measured in an area in the vicinity of the point A where the difference in hardness in the area is in the range of $\pm 5\%$;

determining a point of measurement having a value of hardness closest to ~~an~~ a mean value between the hardness of said central portion and the hardness of said peripheral portion; and

determining the width of said peripheral portion as a distance between the point A and the point of measurement.

Claim 4. (Currently Amended) A golf club head according to claim 2, wherein the width of said peripheral portion of said hitting face is a in the range between about 5 and 20 mm, the width of said peripheral portion being determined by:

measuring a hardness distribution of said hitting face from an arbitrary point A on the edge of said hitting face, passing through the center of said hitting face, to a point B on the opposite edge of said hitting face;

determining the hardness of said central portion by taking an average of the hardness measured in an area in the vicinity of the center of said hitting face where the difference in hardness in the area is in the range of $\pm 5\%$;

determining the hardness of said peripheral portion in the vicinity of the point A by taking an average of the hardness measured in an area in the vicinity of the point A where the difference in hardness in the area is in the range of $\pm 5\%$;

determining a point of measurement having a value of the hardness closest to ~~an~~ a mean value between the hardness of said central portion and the hardness of said peripheral portion; and

determining the width of said peripheral portion which is a distance between the point A and the point of measurement.

Claim 5. (Original) A golf club head according to claim 1, wherein the difference in the hardness between said central portion and said peripheral portion is equal to or greater than 50 in terms of the Vickers hardness, the hardness of said central portion and of said peripheral portion being determined by:

measuring a hardness distribution of said hitting face from an arbitrary point A on the edge of said hitting face, passing through the center of said hitting face, to a point B on the opposite edge of said hitting face;

a1 determining the hardness of said central portion by taking an average of the hardness measured in an area in the vicinity of the center of said hitting face where the difference in hardness in the area is in the range of $\pm 5\%$; and

determining the hardness of said peripheral portion in the vicinity of the point A by taking an average of the hardness measured in an area in the vicinity of the point A where the difference in hardness in the area is in the range of $\pm 5\%$.

Claim 6. (Original) A golf club head according to claim 2, wherein the difference in the hardness between said central portion and said peripheral portion is equal to or greater than 50 in terms of the Vickers hardness, the hardness of said central portion and of said peripheral portion being determined by:

measuring a hardness distribution of said hitting face from an arbitrary point A on the edge of said hitting face, passing through the center of said hitting face, to a point B on the opposite edge of said hitting face;

determining the hardness of said central portion by taking an average of the hardness measured in an area in the vicinity of the center of said hitting face where the difference in hardness in the area is in the range of $\pm 5\%$; and

determining the hardness of said peripheral portion in the vicinity of the point A by taking an average of the hardness measured in an area in the vicinity of the point A where the difference in hardness in the area is in the range of $\pm 5\%$.

Claim 7. (Original) A golf club head according to claim 3, wherein

the difference in the hardness between said central portion and said peripheral portion is equal to or greater than 50 in terms of the Vickers hardness, the hardness of said central portion and of said peripheral portion being determined by:

measuring a hardness distribution of said hitting face from an arbitrary point A on the edge of said hitting face, passing through the center of said hitting face, to a point B on the opposite edge of said hitting face;

determining the hardness of said central portion by taking an average of the hardness measured in an area in the vicinity of the center of said hitting face where the difference in hardness in the area is in the range of $\pm 5\%$; and

determining the hardness of said peripheral portion in the vicinity of the point A by taking an average of the hardness measured in an area in the vicinity of the point A where the difference in hardness in the area is in the range of $\pm 5\%$.

Claim 8. (New) A method for producing a metallic golf club head, comprising the steps of:

forming a face member, a sole member, a crown member, and a hosel member using a metal;

increasing a hardness of the face member by subjecting only the face member to a first heat treatment, and

welding the face member subjected to the first heat treatment to the sole member, the crown member, and the hosel member, and subjecting a periphery portion of the face member to a second heat treatment using heat for welding the face member so that a hardness of the periphery portion of the face member becomes lower than a hardness of a central portion of the face member.

Claim 9. (New) The method according to claim 8, wherein the face member is made of a titanium alloy.

Claim 10. (New) The method according to claim 8, wherein a solution treatment and a subsequent aging treatment, or only an aging treatment is carried out in the first heat treatment.

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a1 Claim 11. (New) The method according to claim 10, wherein the solution treatment is carried out at 700-900°C for 4-6 minutes, and the aging treatment is carried out at 400-600°C for 5-10 hours.

Claim 12. (New) The method according to claim 8, wherein the welding is carried out in an argon atmosphere using a welding current of about 30-90A.
